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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,234	10/07/2005	Kenichiro Fujimoto	186961/US/2-465122-00015	2045

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250 PARK AVENUE  
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EXAMINER
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HEVEY, JOHN A

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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06/16/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/552,234	<b>Applicant(s)</b> FUJIMOTO ET AL.	
	<b>Examiner</b> JOHN A. HEVEY	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14-72 is/are pending in the application.
- 4a) Of the above claim(s) 56-72 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-55 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Status of Application*

Claims 14-15 and 18-20 have been amended. Claims 14-72 are pending, claims 56-72 withdrawn as being directed to non-elected subject matter.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 14-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frampton (US3969274).

Claim 14 is drawn to a catalyst comprising a catalyst support loaded with a metallic compound, wherein said compound is a alkali metal or alkaline earth metal in the amount of 0.01-0.07 mass%. Claim 15, relevant to dependent claims 16,19-20, 22-23, 26-27, 29-30, 34, 36-37, 40-41, 43-44, 47-48, 50-51, and

54-55 further requires the content of said alkali metal or alkaline earth metal to be in the range 0.01-0.04 mass%.

Frampton teaches a catalyst comprising an active catalytic material and a preformed support, wherein the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups IB, IIB, IVB, V, VIB, VIIB and VIII of the Periodic Table of Elements and where the support is a steam treated silica xerogel (see Frampton Claim 1). Frampton further teaches the xerogel support to have a composition of  $\text{SiO}_2$  over 99 wt%,  $\text{Fe}_2\text{O}_3$  0.01-0.03 wt%,  $\text{Na}_2\text{O}$  0.02-0.09 wt%, and  $\text{Al}_2\text{O}_3$  less than 0.4 wt% (see Frampton claim 2). Thus, Frampton teaches a catalyst comprising 0.02-0.09 wt% (equivalent to mass%) of an alkali metal.

It would have been obvious to one of ordinary skill in the art to select from the portion of the overlapping compositional ranges. Overlapping ranges have been held to establish prima facie obviousness.

Claims 16-17 further require the catalyst support with a pore diameter of 8-50 nm, surface area of 80-550  $\text{m}^2/\text{g}$  and pore volume of 0.5-2.0 mL/g. Frampton teaches the xerogel support to have a pore volume of 0.4-2.2 mL/g, surface area 20-800  $\text{m}^2/\text{g}$  (see Frampton claim 2) and a specific example of a silica xerogel support having an average pore diameter of 12 nm, pore volume of 1.04 mL/g, and surface area of 350  $\text{m}^2/\text{g}$  (see Frampton example 1). It would have been obvious to one of ordinary skill in the art to select from the portion of

the overlapping ranges. Overlapping ranges have been held to establish prima facie obviousness.

Claims 21-25 further require the support to be silica with a spherical shape. Frampton teaches the silica gel support made of elementary silica particles having roughly spherical shape (see Frampton column 6, lines 15-18).

4. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frampton (US3969274) in view of Sano et al. (US5604170).

Claims 18-20 further require the catalyst support has a fracture or pulverized ratio of at most 10% when an ultrasonic wave is emitted for approximately four hours, and the catalyst is dispersed in water. Frampton does not discuss the properties of the support under an ultrasonic wave. However, as Frampton teaches a catalyst with substantially the same composition and properties as instantly claimed it would necessarily follow that the catalyst as taught by Frampton would also possess this property. Furthermore, it would have been obvious to one of ordinary skill in the art to optimize the conditions of such a treatment in order to produce a fractured or pulverized ratio as instantly claimed.

Sano(US'170) teaches a solid catalyst component comprising a transition metal, and oxide of silicon or aluminum where the specific surface area is 150-600 m<sup>2</sup>/g, pore diameter is 18-1000 Angstroms (1.8-100 nm), and pore volume is 0.3-2.0 cm<sup>3</sup>/g, and where after the particles are classified into the range of 53-75

microns by a sieving method, the particles are subjected to an ultrasonic disintegration treatment resulting in no more than 30% of the particles being smaller than 50 microns (see Sano Claim 1). The fracture ratio is defined by the instant specification as the mass% of the particles below 20 microns. Although Sano does not explicitly teach the mass% of particles below 20 microns, it would have been obvious to one of ordinary skill in the art to optimize the ultrasonic treatment conditions in order to have a fracture ratio of less than 10%. One would have been motivated to make such a modification in order to produce uniform support particles having beneficial qualities and increased industrial applicability.

5. Claims 28-31, 35-38, 42-45, and 49- 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frampton (US3969274) in view of McVicker (US4154751).

Claims 28-31 and 35-38 further require the metallic compound contain at least one element selected from iron, cobalt, nickel, or ruthenium. Claims 42-45 and 49- 52 further require the metallic compound be made from a precursor of metallic compound of at least one of an alkali metal or alkaline earth metal content of at most 5%. Frampton teaches the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups IB, IIB, IVB, V, VIB, VIIB and VIII of the Periodic Table of Elements (see Frampton claim 1) citing especially the following elements can be used: Cu, Ag, Au, Zn, Cd, Hg, Ti, Bi, Sb, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, N, P, As, **Fe, Co, Ni, Ru** [emphasis

added], Os, Ir, Rh, Pd, and Pt (see Frampton column 4, lines 40-52).

Furthermore, Frampton teaches a specific composition comprising 0.01-0.03 wt%  $\text{Fe}_2\text{O}_3$  and 0.02-0.09 wt%  $\text{Na}_2\text{O}$  (see claim 2) thus reading on the instant claims.

In the alternative, McVicker teaches potassium or rubidium-Group VIII metal cluster catalyst for use in Fischer-Tropsch process reactions, supported by a refractory inorganic oxide or carbon (see McVicker claim 6). McVicker teaches a specific example of an iron/alumina catalyst prepared with 2.2 wt% potassium (alkali metal) and a specific example of a ruthenium catalyst prepared with 0.45 wt% potassium (see McVicker table 3 examples B and E).

It would have been obvious for one of ordinary skill in the art to select iron or ruthenium as a catalyst metal from the teachings of Frampton in view of McVicker. Furthermore, it would have been obvious to modify the catalyst material of Frampton with a K-Fe-Al or K-Ru catalyst metal as taught by McVicker wherein the potassium content is less than 5 wt%.

One would have been motivated to make such modification because it is well known in the art that K is a promoter Fischer-Tropsch synthesis reactions (see McVicker column 2, lines 4-6) and Frampton recognizes the importance of controlling the presence of alkali in the production of catalyst materials and the detrimental effect of highly alkaline solutions to silica gel supports (see Frampton column 5, lines 29-39). The industrial applicability would have been greatly increased by such modification and one would have been expected reasonable

success because the modification is considered well within the level of the ordinary skill in the art.

6. Claims 32-34, 39-41, 46-48, and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frampton (US3969274) in view of Sano et al. (US5604170), further in view of McVicker (US4154751).

Claims 32-34 and 39-41 further require the metallic compound contain at least one element selected from iron, cobalt, nickel, or ruthenium. Claims 46-48 and 53-55 further require the metallic compound be made from a precursor of metallic compound of at least one of an alkali metal or alkaline earth metal content of at most 5%. Frampton teaches the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups IB, IIB, IVB, V, VIB, VIIB and VIII of the Periodic Table of Elements (see Frampton claim 1) citing especially the following elements can be used: Cu, Ag, Au, Zn, Cd, Hg, Ti, Bi, Sb, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, N, P, As, **Fe, Co, Ni, Ru** [emphasis added], Os, Ir, Rh, Pd, and Pt (see Frampton column 4, lines 40-52).

Furthermore, Frampton teaches a specific composition comprising 0.01-0.03 wt%  $\text{Fe}_2\text{O}_3$  and 0.02-0.09 wt%  $\text{Na}_2\text{O}$  (see claim 2) thus reading on the instant claims.

In the alternative, McVicker teaches potassium or rubidium-Group VIII metal cluster catalyst for use in Fischer-Tropsch process reactions, supported by a refractory inorganic oxide or carbon (see McVicker claim 6). McVicker teaches a specific example of an iron/alumina catalyst prepared with 2.2 wt% potassium



(alkali metal) and a specific example of a ruthenium catalyst prepared with 0.45 wt% potassium (see McVicker table 3 examples B and E).

It would have been obvious for one of ordinary skill in the art to select iron or ruthenium as a catalyst metal from the teachings of Frampton in view of Sano, further in view of McVicker. Furthermore, it would have been obvious to modify the catalyst material of Frampton in view of Sano with a K-Fe-Al or K-Ru catalyst metal as taught by McVicker wherein the potassium content is less than 5 wt%. One would have been motivated to make such modification because it is well known in the art that K is a promoter Fischer-Tropsch synthesis reactions (see McVicker column 2, lines 4-6) and Frampton recognizes the importance of controlling the presence of alkali in the production of catalyst materials and the detrimental effect of highly alkaline solutions to silica gel supports(see Frampton column 5, lines 29-39). The industrial applicability would have been greatly increased by such modification and one would have been expected reasonable success because the modification is considered well within the level of the ordinary skill in the art.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 14-55 have been considered but are moot in view of the new ground(s) of rejection. Independent claims 14-15 have been amended to narrow the scope of the invention, necessitating the new grounds of rejection.

8. Applicant argues that Frampton does not teach a catalyst comprising 0.01-0.07 mass% alkali metal or alkaline earth metal. This is not found persuasive. Frampton teaches a compositional range in weight% (equivalent to mass%, see details in rejection above) which clearly overlaps with the instantly claimed ranges. Thus, it would have been obvious to one of ordinary skill in the art to select from the portion of the overlapping ranges.

9. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., reaction activity) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

10. Applicant argues that Frampton in view of Sano does not teach a pulverized or fracture ratio of at most 10%. This is not found persuasive. Frampton in view of Sano teach a catalyst with substantially the same composition and properties as instantly claimed. It would therefore necessarily follow that the catalyst as taught by Frampton in view of Sano would also possess this property. Furthermore, it would have been obvious to one of ordinary skill in the art to optimize the conditions of such a treatment in order to produce a fractured or pulverized ratio as instantly claimed.

11. Finally, applicant argues that Frampton in view of McVicker does not disclose the further addition of one selected from iron, cobalt, nickel and ruthenium and does not disclose a catalyst support. This is not found persuasive. Frampton alone teaches the further addition of iron, and in view of McVicker teaches the use of ruthenium prepared

with at most 5 mass% of alkali metal or alkaline earth metal (see rejection above). The McVicker patent is not relied on for the teaching of a catalyst support, and therefore that argument is moot.

### ***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN A. HEVEY whose telephone number is (571)270-3594. The examiner can normally be reached on Monday - Friday 7:30 AM to 5:00 PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry A Lorengo/  
Supervisory Patent Examiner, Art Unit 1793

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